

Iot BASED INTELLIGENT GARBAGE MONITORING SYSTEM

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Abstract: — Waste management is simple yet effective ways of reducing the amount of waste dumped into our landfills. But there are people who are unaware or even choose to ignore the fact that waste segregation and recycling are environment friendly solutions to the problem of wastes management and disposal. In the Philippines, there are recycling centers but the process is tedious and done manually. There are guidelines implemented by the government with regards to recycling but these efforts have yet to touch the mindset of the people. Escalating amounts of recyclables that are not maximized and indifference in proper waste segregation has led to the group in developing a solution to this. This project IOT Based Intelligent Garbage Monitoring system is a newfangled system which will keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. This system uses two ultrasonic HC-SR04 sensors placed over the bins to track down the garbage level and correlate it with the garbage bin's depth. The system makes use of 8051 microcontroller to control every process and Wi-Fi modem for sending data to server. Dustbins are provided with economical implanted components which helps in tracking the level of the garbage bins and an unparallel ID will be provided for every dustbin so that it is easy to find which garbage bin is full. When the level reaches the threshold limit, the device will transmit the level along with the unique ID provided. This data can be retrieved by the person who has authority to access the data from their place with the help of Internet and an immediate action can be made to empty the dustbins.

Keywords - waste management, file servers, Internet of Things ,acoustics, ultrasonic sensor, wifi esp8266, android application.

I. Introduction

Waste management is an efficient way of reducing abandoned garbage. Unfortunately, these practices are not widely implemented in the country. People have been negligent when it comes to proper waste disposal, ignoring labels and throwing recyclables that can still be reused. Most are unaware or choose to ignore the fact the waste segregation and recycling can reduce cost, reduce drain in our resources, and lessen the waste being produced. Typical composition of garbage people throw in are 5.8% metals, 3.5% glass, 1.6% plastic, 12.9% papers, 1.8% textiles and 53.7% biodegradables which means only the remaining 20.7% of the wastes should really be going to our landfills. In our country, recycling centers do manual process of sorting wastes leading to a high risk of acquiring sickness. This study aims to automate waste segregation and implement a waste delivery system that would minimize human interference in the waste collecting and segregation process. Garbage may consist of the undesirable things left from City, Public area, Society, College, Homes etc. This project is related to the "intelligent City" and based on "Internet of everything" .So for smart lifestyle, cleanliness is needed, and tidiness begins with Garbage Bin. This project will help to wipe out or lessen the garbage removal problem. The Internet of Things (IoT) is a recent communication pattern that will visualize the near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol that will make them able to convey with one another and with the users, becoming an essential part of the Internet.

II. Working principle

In IoT based garbage management, we are showing one live garbage bin. Each garbage bin has two slots, one for wet and other for dry. Height of waste in both slots is measured with help of ultrasonic sensors and that information is transferred to server via wifi module to PC server. A four way DIP switch is used to give each dustbin an ID and that ID with predefined location information is stored in database on server PC. Dustbin forwards three type of data using WiFi module to PC, 1. ID of a bin , 2. Dry waste in percentage, 3. Wet waste in percentage to PC server through wifi module via network (intranet).C server has display screen which consists of ,Dustbin ID, Location information, Wet waste percentage, Dry waste percentage. Server will send

data about the bin to Android app. On Android app, user can view the percentage of Dry bin and percentage of Wet bin. When any bin is about to full, user / driver will get a pop up message on app with text as well as in speech format using TTS. Dustbin side wi-fi, PC and android will be connected to same network, hence it is Intranet communication.

III. Block diagram

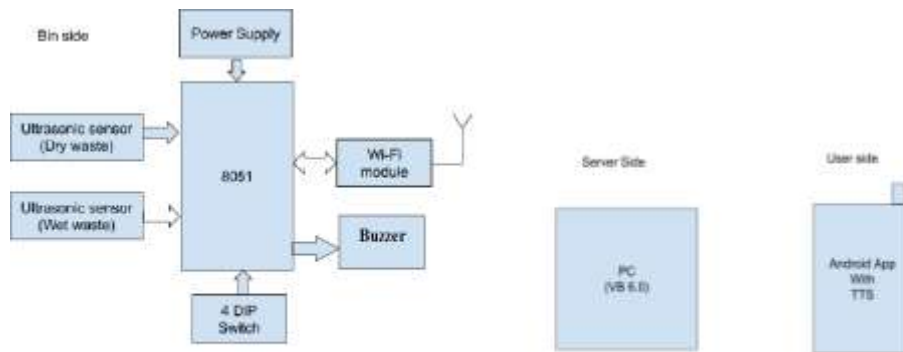


Fig 1. Bin Side

Fig 2. Server side

IV. System Review

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- Each garbage bin has two slots, one for wet and other for dry. Height of waste in both slots is measured with help of ultrasonic sensors and that information 8051 microcontroller will transfer to server via wifi module to PC server.
- A four way DIP switch is used to give each dustbin an ID and that ID with predefined location information is stored in database on server PC.
- Dustbin forwards three type of data using WiFi module to PC, 1. ID of a bin, 2. Dry waste in percentage, 3. Wet waste in percentage to PC server through wifi module via network (intranet).
- PC server has display screen which consists of Dustbin ID, Location information, Wet waste percentage, Dry waste percentage.
- Server will send data about the bin to Android app.
- On Android app, user can view the percentage of Dry bin and percentage of Wet bin.
- When any bin is about to full, user / driver will get a pop up message on app with text as well as in speech format using TTS.
- Dustbin side wi-fi, PC and android will be connected to same network, hence it is Intranet communication.

V. Future Scope

- This project will help to get the wet/dry data in a particular area and the system can be developed accordingly.
- This project is already in used in the city of Bangalore for waste management.
- The restriction of coverage area can be lifted up by using GPS in the future.

VI. Conclusion

This project is the execution of intelligent garbage monitoring system using ultrasonic sensors, microcontroller 8051 and esp8266. This system makes sure that the clearing of dustbins soon when the garbage level reaches its threshold. In major cities the garbage truck visits the area everyday depending on the population of a particular area and sometimes these dustbins may not be filled. Our System will inform the condition of each dustbin in real time so that the concerned authority can send the garbage collection truck only when the dustbin reaches its saturation value. It helps to keep cleanliness in the society. Therefore, the intelligent garbage monitoring system makes the garbage collection more economical. Garbage may consists of the unwanted material left over from City, Public area, Society, College, Homes etc. This project is related to the "Smart City" and based on "Internet of Things" (IOT). So for smart lifestyle, cleanliness is needed, and cleanliness is begins with Garbage Bin. This project will help to kill or minimize the garbage disposal problem.

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